TRAITEMENTS MEDICAUX ET CHIRURGICAUX
TREATMENT OF DISORDERS OF THE EQUINE NASAL CAVITIES AND SINUSES

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Résumé : Les kystes du diverticule nasal peuvent être excisés intégralement sous anesthésie locale sur le cheval debout. La majorité des cas de rhinite fongique réagiront au traitement topique (antifongiques). La plupart des cas de sinusite primaire aiguë se résoudront sans traitement, mais les cas plus chroniques nécessiteront un lavage des sinus à haut débit, utilisant un cathéter à demeure. Les cas réfractaires à ces traitements peuvent nécessiter une sinusotomie chirurgicale, afin d’ôter le pus épais. Certains cas imposent une fistulation sino-nasale pour un meilleur drainage. La plupart de ces interventions peuvent être réalisées sur le cheval debout (sous sédatifs). Les cas de sinusite dentaire nécessitent l’extraction de la molaire infectée, de préférence par une extraction orale associée à un lavage des sinus. L’excision chirurgicale des kystes sinusiens a un pronostic très favorable, mais la plupart des tumeurs des sinus sont hautement malignes et leur excision est d’un pronostic très défavorable. L’approche thérapeutique préférable de l’hématome ethmoïdal progressif consiste en une injection intra-lésionnelle de formol par voie endoscopique.

Mots clés : chirurgie sino-nasale, sinusotomie, lavage des sinus

Abstract: False nostril cysts can be fully excised using local anaesthesia in the standing sedated horse. Most cases of mycotic rhinitis will respond to topical antimycotic agents. Most cases of acute primary sinusitis will resolve without treatment, but more chronic cases should have high-volume sinus lavage using an indwelling intra-sinus catheter. Cases that do not respond to this treatment may require surgical sinusotomy to remove inspissated pus and some require sino-nasal fistulation to improve drainage and most such surgery can be performed in the standing sedated horse. Cases of dental sinusitis, require extraction of the infected cheek tooth, preferably by oral extraction along with sinus lavage. Sinus cysts can be surgically removed and have an excellent prognosis, but most sinus tumours are highly malignant and carry a poor prognosis after removal. Progressive ethmoid haematoma lesions are best treated by repeated intra-lesional, trans-endoscopic injection of formalin.

Key words: sino-nasal surgery, sinusotomy, sinus lavage

NASAL CAVITY

Alar Fold Collapse
The alar fold may be surgically removed in affected horses under general anaesthesia. A ventro-lateral nostril incision is made for access and the alar fold is uncurled and resected at its attachment to the alar cartilages and ventral concha. A continuous suture pattern, using absorbable sutures is used to control haemorrhage along this highly vascular site. The nostril incision used for access should be carefully sutured to prevent stricture at this site.

**False Nostril Cyst**

Treatment (usually for cosmetic reasons) is by total removal of the cyst by a lateral surgical approach following use of an infra-orbital nerve block and local anaesthesia. A 5-7cm rostro-caudal skin and subcutaneous incision is made directly over the cyst – taking care not to rupture the thin walled cyst, now or during the subsequent blunt subcutaneous dissection using a curved artery forceps. The skin incision should be fully closed, even if there is a breakdown in asepsis, as there is usually direct drainage into the false nostril. The cyst can also be removed using a ventriculectomy burr inserted via the false nostril into the cyst - after local anaesthesia of the overlying false nostril mucosa. After scrubbing the nasal diverticulum, a 1-cm stab incision is made into the rostroventral aspect of the cyst, and the cyst’s contents are expressed into the cavity of the false nostril. A laryngeal burr is inserted into the lumen of the cyst and rotated to engage the cyst’s lining. The burr is retracted, evertting the wall of the cyst, which is then excised. If the thin cyst lining tears, the burr is reinserted, rotated, and retracted to remove residual cyst lining. The incision is left open and heals by second intention.

**Nasal Tumours**

Unless detected early, most equine nasal tumours are impossible to surgically treat, but radiotherapy could be considered – after surgical debulking if necessary. Occasionally a benign tumour can be successfully surgically removed by rhinotomy. Euthanasia is indicated if the tumour is advanced.

**Nasal Mycosis**

One should ensure the mycotic plaques are the primary problem (i.e. are not secondary to a nasal tumour or dental problem) and any dusty or poorly ventilated environments should be corrected. Larger mycotic plaques can be removed transendoscopically prior to topical therapy of the lesions with antifungal drugs including itraconazole, fluconazole, enilconazole, miconazole, ketoconazole, natamycin, and clotrimazole that are usually administered via a transendoscopic catheter, but also via ipsilateral sinus lavage using an indwelling frontal sinus catheter. Treatment is usually successful in cases of primary mycotic sinusitis, but in cases of mycotic granuloma, surgical debulking may also be required.

**Nasal Trauma**
Most traumatic nasal mucosal damage with epistaxis in horses will cease spontaneously within a few minutes. Packing the nose, as is often done for human epistaxis, is of questionable value in horses, as this procedure is resented in un-sedated horses and the site of haemorrhage is generally difficult to identify and therefore to pack. Putting the horse in a deeply bedded box, closing the top door and turning off the lights for 15 minutes is a time honoured and effective treatment for traumatic epistaxis!

**Nasal septum deviation**
With difficulty and much haemorrhage, these lesions can be corrected by fracturing and re-alignment of the premaxillary bone and nasal septum removal. Less severe lesions may be partially corrected by orthodontic treatment.

**Primary Sinusitis**
Acute cases of primary sinusitis will often clear spontaneously and antibiotics may help some early cases. In more chronic cases where there may be compromised sinus drainage, surgical lavage of a empyematous sinus can be performed under sedation and local anaesthesia, using a trephine opening (usually into the frontal sinus). The technique described previously for sinoscopy can be used. An indwelling catheter (>1 metre) with side-holes is inserted about 5 cm into the frontal sinus and sutured in place. Sinus irrigation should be performed 2-3 times daily for about 1 week using 3-5 litres of very dilute povidine iodine or chlorohexidine solution. If the pus becomes inspissated in the sinuses, especially in the ventral conchal sinus (and/or rostral maxillary sinus), the sinusitis will not respond to lavage and will later require surgical removal under standing sedation or general anaesthesia.

The best surgical approach in these non-responsive sinusitis cases is by use a large naso-frontal flap that is hinged medially in the standing or anaesthetised horse. This approach allows good access to the caudal maxillary sinus and thus to the caudo-dorsal aspect of the ventral conchal sinus (the ventral conchal bulla), that can be opened (with minimal haemorrhage usually). A search is made for inspissated pus which is then removed. In older horses, that have shorter reserve crowns and thus better access to the ventral conchal sinus, a maxillary sinusotomy can be performed (Fig 1).
Fig 1. Insipissated pus being removed from the caudal maxillary cavity of a horse with chronic primary sinusitis during standing surgery. An opening has also been made for frontal sinus catheter placement.

The septum between the caudal and rostral maxillary sinuses is removed if necessary and the latter cleared of any exudate that is present. It is worthwhile vigorously irrigating all of these sinuses during surgery – as often large hidden pieces of inspissated pus will be flushed out. Much of this lavage fluid should flow down the ipsilateral nasal cavity through the normal sino-nasal drainage opening. If this does not occur – this indicates obstructed sino-nasal drainage and the creation of a surgical fistula between the dorsal aspect of the ventral concha and the nasal cavity should be considered. This fistulation will cause much epistaxis that will need to be temporarily controlled by inserting a long (eg 5 metres) and wide bandage up the affected nasal cavity and into the affected sinus – where it is packed tightly in concertina fashion.

The nasofrontal bone flap is secured back in place using two steel sutures in pre-drilled openings in the bones. The subcutaneous tissues are closed in a continuous manner and the skin wound (fig 2) is stapled – often leaving a small dependent area of wound open for drainage. Post-operative lavage is performed for 1 week – with absence of malodour a good indicator of success. Cases that do not respond to surgical treatment should be thoroughly re-evaluated for evidence of dental disease and other underlying causes of sinusitis.
Fig 2. The subcutaneous tissues being sutured following a maxillary bone flap sinusotomy in a standing horse. Note the indwelling frontal sinus catheter to be used for post-operative sinus lavage.

Dental Sinusitis
On occasions it will not be possible to determine definitively if a cheek tooth is infected and in such cases the sinusitis should be treated as a primary sinusitis – the risks of removing a normal cheek tooth are very great. If a diagnosis of apical infection is fully confirmed, removal of the affected teeth is indicated, preferably by oral extraction- where general anaesthesia is avoided and additionally, post-extraction sequelae are much less common than with repulsion. The evaluation and extraction of an infected cheek tooth, by any technique, are very specialised procedures and should only be undertaken by experienced personnel with adequate facilities.

Sinus Cyst
Most sinus cysts involve the maxillary sinuses and the precise sites of these expansive lesions can usually be determined by position of the overlying facial swellings. Treatment is often performed in the standing horse (lower cost and anaesthesia risk; and less intra-operative haemorrhage - due to the higher position of the horse’s head). Surgically remove the cyst using an appropriate bone flap – sometimes the thinned sinus wall can be opened with just a scalpel. As much as possible of the cyst wall should be removed, but often parts will remain attached to intra-sinus structures - these residual parts are of no concern. Secondary sinus empyema should be lavaged –especially if inspissated. Assess and surgically improve the naso-maxillary drainage if required. There is an excellent prognosis after sinus cyst surgery.

Mycotic Sinusitis
Local irrigation of the affected sinus with the above named (nasal mycosis) agents including enilconazole or natamycin using an indwelling catheter is usually successful. If this treatment is not successful – a careful re-assessment of the case should be made for the presence of underlying lesions.
**Progressive Ethmoid Haematoma**

With the usual PEH lesions that are protruding into the nasal cavity, repeated, transendoscopic intra-lesional formalin injections in a standing sedated patient offers the best treatment. The distal end of an appropriately sized, plastic trans-endoscopic catheter is cut transversely and this sharp catheter tip is inserted through the PEH capsule into the middle of the lesion (Fig 3). Depending on the size of the PEH lesion, 5-20 mls of 10% formalin is injected into it – until the formalin flows out of the lesion. Horses may snort violently at this stage and lavage of the adjacent ethmoturbinate and nasal area with 500mls of lukewarm water through the endoscope biopsy channel will reduce the local irritation of this sensitive area by the leaked formalin.

With intra-sinus PEH lesions, a trephine opening is made into the frontal sinus (often for diagnostic reasons initially) and the PEH lesion is similarly injected with formalin trans-endoscopically. PEH lesions will need to be re-treated on a variable number of occasions. Small exposed PEH lesions can be treated by trans-endoscopic laser ablation.

Surgical excision of PEH lesions using a naso-frontal sinus approach is an alternative but traumatic approach, but may occasionally be required with very extensive lesions that completely fill the sinuses for initial de-bulking of large lesions, prior to intra-lesional formalin treatment at their base.

**Fig. 3.** Formalin being injected into a PEH lesion using a trans-endoscopic catheter

**Suggested Reading List.**


